SPECIFICATION

TITLE OF INVENTION

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Title: Screw Tight Tube Vice Frame

Inventors: Stephen Andrew Godoy and Arthur Alexander Godoy

Citizenship (Both Inventors): American

Residence (Both Inventors): 205 Santa Ana Avenue, Long Beach, California, U.S.A. 90803

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO A MICROFICHE APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

This invention pertains to the field of tattooing, and is intended to improve the method used to secure the tube grip to the tattoo machine frame. The tube grip houses the needle bar that holds the needle grouping, which moves into and out of the skin in the act of tattooing.

Because tattoos must be applied in a sterile manner, the tube grip and needle groupings must be removable to allow them to be cleaned and sterilized. On all modern tattoo machines, the tube grip is a removable part. Existing tube vice technology uses several methods to secure the tube grip to the tattoo machine frame, but many of these methods tend to bend or crimp the cylindrical tube grip. The Screw Tight Tube Vice Frame (shown in Figure 2) is designed to allow the tube grip to be

secured to the frame with a simple twist and released with a counter twist. The Screw Tight Tube Vice Frame secures the tube grip in place just as securely as or more securely than existing technology, but will not bend or crimp the tube grip.

BRIEF SUMMARY OF THE INVENTION

The object of the Screw Tight Tube Vice Frame is to secure the tube grip to the frame in a manner that improves on the methods currently used by tattoo machines, while providing a housing for the tattoo machine components. The Screw Tight Tube Vice Frame consists of a tube vice frame, into which holes are drilled and tapped for attaching the frame to other tattoo machine components, and a tube vice mechanism for attaching the tube grip to the frame. This tube vice mechanism allows the tube grip to be secured to the frame with a simple twist, and released with a counter twist, without bending or crimping it. This is important because the tube grip with needle groupings is removed often to allow for cleaning and sterilization.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

- Figure 1 shows the tattoo machine with the Screw Tight Tube Vice Frame.
- Figure 2 shows the components of the Screw Tight Tube Vice Frame in detail.

DETAILED DESCRIPTION OF THE INVENTION

Components

The Screw Tight Tube Vice Frame consists of a tube vice frame and a tube vice mechanism, which attaches a tube grip of standard industry measurement to the frame. The tube vice mechanism may include a removable hollow threaded rod to house the compression ferrule, or the hollow threaded section that houses the compression ferrule may be cast or machined as part of the frame. The tube vice mechanism also includes a compression nut that is tightened around the compression

ferrule to secure the tube grip to the frame, and loosened to release it from the frame. The specifications for the threaded rod and compression ferrule are as follows:

- threaded rod: approximately 1/2" to 5/8" long, with 1/2 20 threading; the inside diameter of the hollow centre measures 5/16" or 11/64"
- compression ferrule: usually measures 1/4" tall, with an inside diameter of 5/16"

Manufacturing and Assembly

The Screw Tight Tube Vice Frame may be made of metal (such as aluminum, brass, steel, or iron) or any other rigid material (such as plastic, fibreglass, or lexan). Holes are drilled in the tube vice frame as follows:

- hole drilled for the upper binding post
- hole drilled for the lower binder post
- two holes drilled on the flat plane for the screws that secure the coils (one hole per coil)
- drilled and tapped hole for the screw that secures the rear spring saddle to the frame

The tube vice mechanism, which is used to attach a tube grip of standard industry measurement to the frame, is located on the front lower portion of the frame. It may include a removable hollow threaded rod to house the compression ferrule, or the hollow threaded section that houses the compression ferrule may be cast or machined as part of the frame.

If a removable threaded rod is used to house the compression ferrule, an internal taper is machined into the lower entrance of the threaded rod, starting at the outside diameter and machining inwards to a recommended depth of 1/8". The entry to the threaded rod is tapered internally to approximately the same degree as the compression ferrule to allow the rod to house the ferrule. The threaded rod is attached to the tube vice frame by machining the frame as follows:

- a hole measuring 29/64" in diameter is step-drilled two-thirds of the way into the front lower section of the frame

- a secondary hole measuring 5/16" or 11/64" in diameter is drilled through the remaining one-third of the frame, using the same center point as the previous hole
- the 29/64" hole is tapped with a 1/2 20 bottoming tap from the entrance of the hole, starting at the bottom of the frame and continuing through to the end of the step drilling (approximately two-thirds of the way into the frame)
- the threaded rod is screwed into the threaded hole

If the hollow threaded section is cast as part of the frame, it protrudes approximately 1/2" from the bottom of the frame (the same length as the threaded rod, described above, would protrude once screwed into the frame). If the frame is cut on a CNC mill, the hollow threaded section may also be machined into the frame, protruding approximately 1/2" from the bottom of the frame (again, the same length as the threaded rod or cast threaded section would protrude from the frame). The same taper (recommended depth of 1/8") applies whether a removable threaded rod is used to house the compression ferrule or the threaded section is cast or machined as part of the frame.

The compression ferrule is usually made of a flexible material (often brass). It is tapered on both ends; the tapers meet in the middle. A slit is made vertically through half of the ferrule to allow flexibility when it is compressed and tightened around the tube grip. The compression ferrule is placed into the hollow section of the threaded rod or frame.

The compression nut is step drilled, drilled, and tapered to the same specifications as the threaded rod. It may be machined from any type of metal. It is screwed onto the threaded rod or threaded section of the frame that houses the compression ferrule with a tightening motion to secure the tube grip, or unscrewed in a loosening motion to release the tube grip.

Function

When the compression nut is turned clockwise in a tightening motion, the bevels make contact and slide over each other, creating pressure on the compression ferrule and causing it to

compress. The vertical slit provides greater room for compression as the ends of the slit move toward each other, creating a squeezing effect and securing the tube grip to the frame.

Turning the compression nut counter-clockwise in a loosening motion relieves the pressure on the compression ferrule, resulting in the release of the tube grip.